ZHURAVLEVA, T.S.; KESSENIKH, A.V.

Spin-lattice relaxation of some organic free radicals stabilized in the solid phase. Zhur. struk. khim. 6 no.3:453-454 My-Je '65. (MIRA 18:8)

1. Fiziko-khimicheskiy institut imeni L.Ya.Karpova.

EPF(n)-2/EWA(h)/EWP(j)/EWP(k)/EWT(l)/EWT(m)/T/EWA(l) IJP(c) GG/RM/WG/
ACC NR: AP5014011 WW SOURCE CODE: UR/0192/65/006/003/0453/0454

AUTHOR: Zhuravleva, T. S.; Kessenikh, A. V.

ORG: Physicochemistry Institute im. L. Ya. Karpov (Fiziko-khimicheskiy institut)

TITLE: Spin-lattice relaxation of some organic free radicals stabilized in a solid phase

SOURCE: Zhurnal strukturnoy khimii, v. 6, no. 3, 1965, 453-454

TOPIC TAGS: free radical, spin lattice relaxation, gamma irradiation, hydrocarbon, aldehyde, organic nitrile compound

ABSTRACT: The authors measure T_1 (Spin-Lattice Relaxation Time) at 77 and 4.2°K for a radical formed during gamma irradiation of chemically pure, deoxidized phenyl methyl acetylene, methyl acetylene, acetonitrile and acetal aldehyde. A table of spin relaxation time is presented. The authors thank L. S. Korniyenko and N. Ye. Kask for their assistance in carrying-out the experiment and also I. V. Aleksandrov for discussions of the results. Orig. art. has: 1 table. [JPRS]

SUB CODE: 07, 20 / SUBM DATE: 26Oct64 / ORIG REF: 003 / OTH REF: 001

Card 1/1

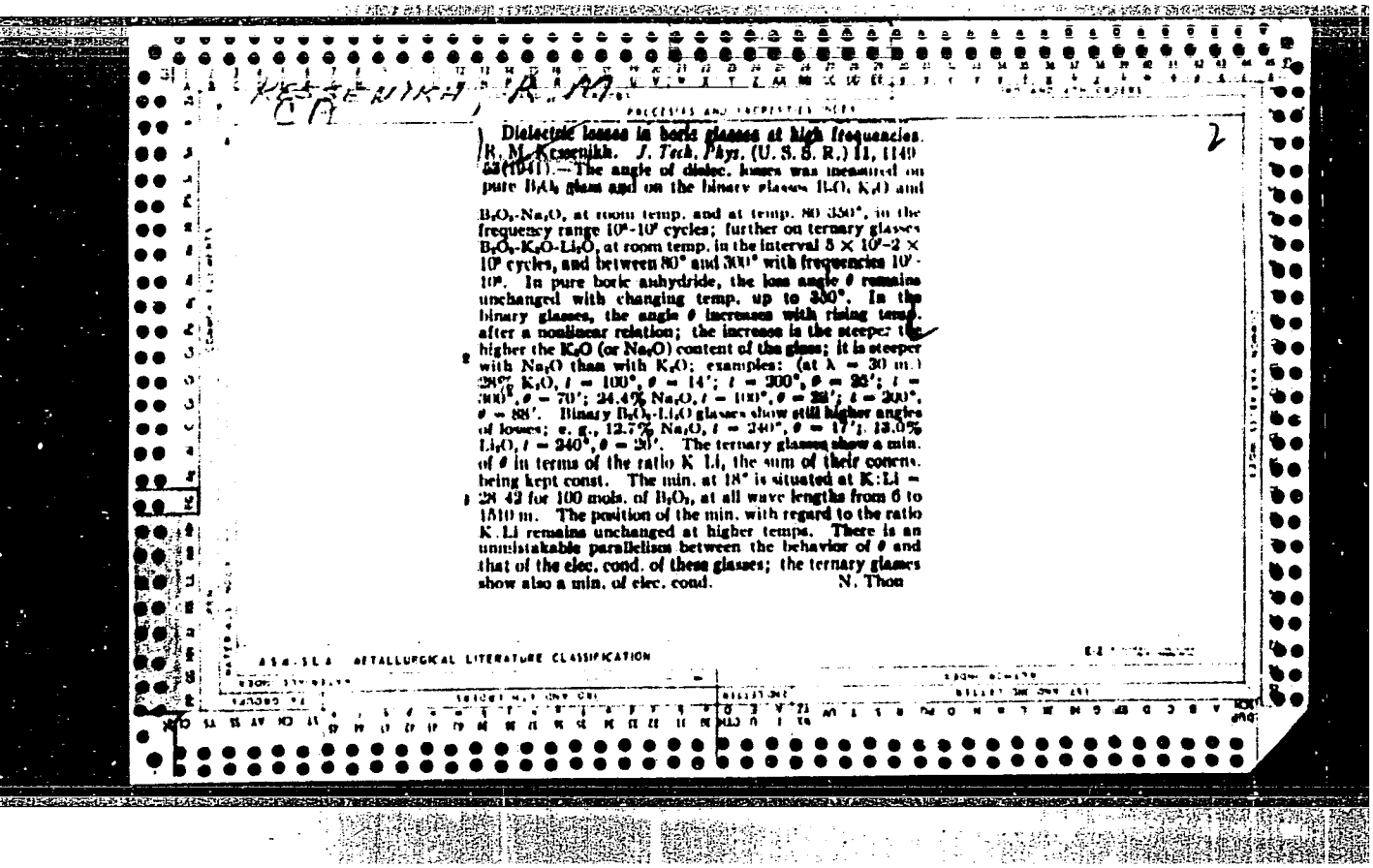
UDC: 547.024

KESSELRING, W.

Spraying, but in proper time! p. 14.

LAS POLASKI. (Ministerstwo Lesnictwa oraz Stowarzyszenie Naukowo-Techniczne Inzynierow i Technikow Lesnictwa i Drzewnictwa) Warszawa, Poland. Vol. 32, no. 10, May 1958.

Monthly List of East European Accession (EEAI) LC, Vol. 9, no. 1, Jan. 1960. Uncl.



PROCESSES AND PROPERTIES INDEX

Dielectric losses in boric glasses at high frequencies. R. M. Kvasnikh. *J. Tech. Phys.* (U. S. S. R.) 11, 1149-53(1941).—The angle of dielec. losses was measured on pure B_2O_3 glass and on the binary glasses B_2O_3-K_2O and B_2O_3-Na_2O, at room temp. and at temp. 80-330°, in the frequency range 10^6-10^8 cycles; further on ternary glasses B_2O_3-K_2O-Li_2O, at room temp. in the interval 5×10^6-2×10^8 cycles, and between 80° and 300° with frequencies 10^7-10^8. In pure boric anhydride, the loss angle θ remains unchanged with changing temp. up to 330°. In the binary glasses, the angle θ increases with rising temp. after a nonlinear relation; the increase is the steeper the higher the K_2O (or Na_2O) content of the glass; it is steeper with Na_2O than with K_2O; examples: (at λ = 30 m.) 28% K_2O, t = 100°, θ = 14'; t = 300°, θ = 25'; t = 300°, θ = 70'; 24.4% Na_2O, t = 100°, θ = 28'; t = 200°, θ = 88'. Binary B_2O_3-Li_2O glasses show still higher angles of losses; e. g., 12.7% Na_2O, t = 240°, θ = 17'; 13.0% Li_2O, t = 240°, θ = 20'. The ternary glasses show a min. of θ in terms of the ratio K:Li, the sum of their concns. being kept const. The min. at 18° is situated at K:Li = 28:42 for 100 mols. of B_2O_3, at all wave lengths from 6 to 1810 m. The position of the min. with regard to the ratio K:Li remains unchanged at higher temps. There is an unmistakable parallelism between the behavior of θ and that of the elec. cond. of these glasses; the ternary glasses show also a min. of elec. cond. N. Thon

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

SOV/139-58-6-14/29

AUTHOR: Kessenikh, R.M.

TITLE: Effective Electrical Conductivity of Continuous Media at High Frequencies and its Connection with Longitudinal Oscillations of Plasma (Effektivnaya elektroprovodnost' sploshnykh sred pri vysokoy chastote i yeye svyaz' s prodol'nymi kolebaniyami plazmy)

PERIODICAL: Izvestiya Vysshikh Uchebnykh Zavedeniy, Fizika, 1958, Nr 6, pp 85-90 (USSR)

ABSTRACT: The permittivity ε for a solid dielectric is written as a complex function of frequency in the following way:

$$\varepsilon\omega = \varepsilon'(\omega) + i\varepsilon''(\omega) \qquad (1)$$

Here ω is the angular frequency of the applied electromotive force, ε' and ε'' respectively represent the ohmic and reactive components of ε and i represents $\sqrt{-1}$. This equation together with the relation

$$i\omega\vec{E}\varepsilon(\omega) = 4\pi\vec{j} \qquad (2')$$

between the electric field-vector and the total current-vector $\vec{j}$ enables the current density to be separated

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Effective Electrical Conductivity of Continuous Media at High Frequencies and its Connection with Longitudinal Oscillations of Plasma

into ohmic and reactive parts according to:

$$j_a = \frac{\omega\varepsilon''(\omega)E}{4\pi} \qquad (3)$$

and $$j_p = \frac{i\omega\varepsilon'(\omega)E}{4\pi} \qquad (4)$$

The power dissipation P in the medium is of course simply $j_c E$ and one may define an effective electrical conductivity $\sigma_{eff} = P/E^2$ by analogy with direct current theory. From the above relationships there follows immediately the following expression for σ_{eff} in terms of the phase angle δ

$$\sigma_{eff} = \frac{\omega\varepsilon'(\omega)}{4\pi} \tan\delta \qquad (12)$$

where $\tan\delta = \frac{\varepsilon''(\omega)}{\varepsilon'(\omega)}$

Effective Electrical Conductivity of Continuous Media at High Frequencies and its Connection with Longitudinal Oscillations of Plasma

For practical computation σ_{eff} is more conveniently expressed as

$$\sigma = \frac{\varepsilon''}{60\lambda} \qquad (12')$$

where λ is the wavelength in metres associated with the angular frequency ω. Values of σ_{eff} are tabulated for some typical dielectrics (ceramic VK-92, "Ftoroplast-4" (probably p.t.f.e.), polyethylene and polystyrene) for wavelengths in the 15-4c m region; in each case σ_{eff} is seen to exceed the corresponding d.c. conductivity by a factor of about 10^{+8}. Graphs are also presented showing the variation of σ_{eff} with frequency. Finally the connection of the above theory with the theory of longitudinal plasma oscillations is briefly discussed. The equations for energy dissipation as a function of frequency are formally similar in the two cases and it is suggested therefore that the behaviour of an oscillating plasma might be discussed by replacing it

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Effective Electrical Conductivity of Continuous Media at High Frequencies and its Connection with Longitudinal Oscillations of Plasma

by a mathematically equivalent dielectric. The analogy is not pursued in detail. There are 2 figures, 1 table and 2 references of which 1 is Soviet and 1 English.

ASSOCIATION: Tomskiy Politekhnicheskiy Institut imeni S.M.Kirova (Tomsk Polytechnical Institute imeni S.M.Kirov)

SUBMITTED: 14th June 1958

KESSENIKH, R.M.

Effect of dielectric losses of chassis material on the quality of one-layer cylindrical coils. Izv. TPI 95:226-233 '58.
(MIRA 14:9)

1. Predstavleno professorom doktorom A.A.Vorob'yevym.
(Dielectric loss) (Electric coils)

KESSENIKH, R.M.

Effective electroconductivity of continuous media at high frequency and its relation to longitudinal plasma oscillations. Izv.vys.ucheb. zav.; fiz. no.6:85-90 '59. (MIRA 12:4)

1. Tomskiy politekhnicheskiy institut im. S.M. Kirova.
(Dielectrics)

88052

9,9000 (and 2404, 2209, 2109) S/139/60/000/006/019/032
E032/E414

AUTHORS: Sernikov, V.G. and Kessenikh, R.M.

TITLE: Determination of the Velocity of Ultrasonic Waves in Polymers

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Fizika, 1960, No.6, pp.126-129

TEXT: Various ultrasonic methods have been used to study the mechanical properties of polymers. The "composite vibrator" method has been used by the present authors at the Tomsk Polytechnical Institute. The composite piezo-quartz vibrator consisted of a quartz rod having a resonance frequency of 125 kc/s and the specimen under investigation which was attached to the quartz rod by means of shellac. The following conditions were observed in the preparation of the specimens: $\ell \gg h$ and $\ell \gg b$, where ℓ is the length of the specimen and b and h are the width and thickness respectively of the specimen. The composite vibrator method was used to determine the velocity of ultrasonic waves in the polymer, and Young's modulus was then calculated from the usual formula:

$$v = \sqrt{E/\rho} \qquad (1)$$

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Determination of the Velocity of Ultrasonic Waves in Polymers

where ρ is the density and E is Young's modulus. The velocity of the ultrasonic waves was calculated from the formula $v = 2\ell f$ where ℓ is the length of the specimen and f is the resonance frequency of the specimen which is given by $f = f_r - (m_r / m_0)(f_r - f_s)$. In the latter formula f_r is the resonance frequency of the quartz rod with the specimen in position, f_s is the resonance frequency of the quartz rod plus the shellac layer, m_r is the mass of the quartz rod and the shellac layer, and m_0 is the mass of the specimen. The above masses were determined with the aid of analytical balances and the density of the polymers was calculated from the geometrical dimensions and the weight of specially prepared specimens. The following Table gives the dynamic Young's moduli obtained experimentally at $t = 20°C$.

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Determination of the Velocity of Ultrasonic Waves in Polymers

Name of Polymer	Young's Modulus E x 10^{-11} dyne/cm^2
Polystyrene	0.347
Polymonochlorostyrene	0.385
Polydichlorostyrene	0.411
Epoxide resin	0.297

The velocity of ultrasonic waves was also measured as a function of temperature. For this purpose the vibrator was placed in a specially constructed temperature-regulated enclosure. There are 3 figures, 2 tables and 4 Soviet references.

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Determination of the Velocity of Ultrasonic Waves in Polymers

ASSOCIATION: Tomskiy politekhnicheskiy institut imeni S.M.Kirova (Tomsk Polytechnical Institute imeni S.M.Kirov)

SUBMITTED: May 4, 1960

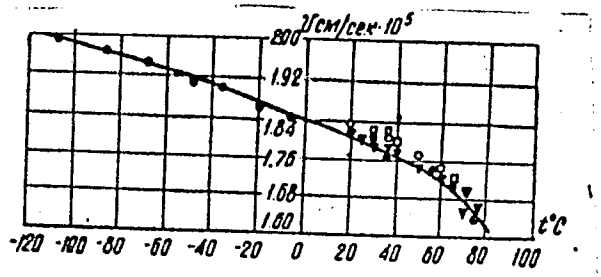

Рис. 1. Зависимость скорости ультразвука от температуры для полистирола.

Fig.1. Velocity of ultrasonic waves (cm/sec x 10⁵) as a function of temperature (°C) for polystyrene.

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Determination of the Velocity of Ultrasonic Waves in Polymers

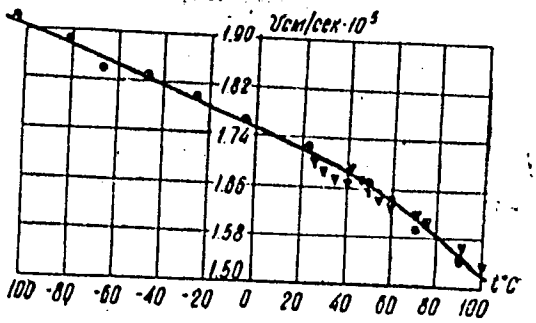

Рис. 2. Зависимость скорости ультразвука от температуры для полидихлорстирола.

Fig.2. Velocity of ultrasonic waves as a function of temperature for polydichlorostyrene

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Determination of the Velocity of Ultrasonic Waves in Polymers

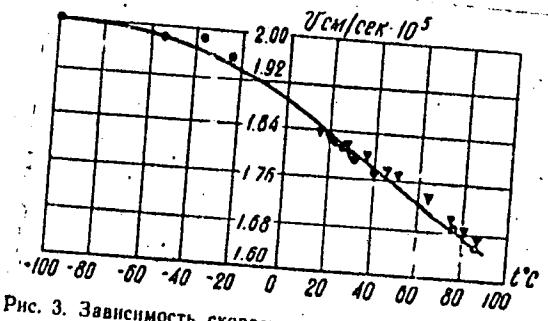

Рис. 3. Зависимость скорости ультразвука от температуры для полимонохлорстирола.

Fig.3. Velocity of ultrasonic waves as a function of temperature for polymonochlorostyrene.

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S/110/61/000/001/002/023
E032/E455

AUTHORS: Anikeyenko, V.M., Engineer and
Kessenikh, R.M., Candidate of Technical Sciences

TITLE: Thermal Expansion of Polymers

PERIODICAL: Vestnik elektropromyshlennosti, 1961, No 1, pp 4-6

TEXT: An experimental study is reported of the thermal expansion of polystyrene, polydichlorostyrene, polymonochlorostyrene, polyethylene and Teflon ("ftoroplast-4"). The first three polymers were prepared from powders using normal techniques, while polyethylene and Teflon were of the commercially available variety. In all cases, the structure of the specimens was checked by X-ray methods. The specimens were cylindrical in form (dia. 6 mm, length 4 to 6 mm). The thermal expansion was investigated by an interference method, so that practically no stresses were applied to the specimens. The relative expansion was measured with temperatures rising in the range 20 to 100°C and also with temperatures falling in the same range. The rate of heating was 0.5°C/min and the rate of cooling 0.75°C/min. The expansion coefficient α was calculated from the formula

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E032/E455

Thermal Expansion of Polymers

$$\alpha = \frac{\Delta l}{l(\vartheta_2 - \vartheta_1)}$$

where l is the length at $\vartheta = 20°C$. The temperature was measured by a copper-constantan thermocouple and no heat treatment was applied to the specimen before measurement. The hysteresis effect in the thermal expansion was observed in all the specimens. The temperature coefficient of linear expansion for the above materials was found to be large [(58 - 200) x 10^{-6} deg^{-1} at 30°C]. Amorphous and crystalline polymers were investigated separately. It is well-known that the reason for the thermal expansion of solid bodies is the increase in the thermal vibrations of particles with increasing temperature. In the above materials the structural elements taking part in the thermal vibrations are macromolecules as a whole, isolated parts of the macromolecules and also side radicals. Thermal expansion is affected both by internal molecular displacements and intermolecular forces. It would, therefore, appear that the presence of polar groups in a polymer

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Thermal Expansion of Polymers

would affect its thermal expansion. Polar polymers should have lower values of the linear expansion coefficients than non-polar polymers. This was found to be the case for polychlorostyrene, in which the temperature coefficient of linear expansion between 20 and 100°C was found to lie between 58.7×10^{-6} and 66.0×10^{-6}, while for polystyrene in the range 20 to 85°C, the temperature coefficient was found to lie between 74.4×10^{-6} and 75.4×10^{-6}. For polymonochlorostyrene this rule does not hold, beginning at approximately 55°C. The temperature coefficient of polymonochlorostyrene in the temperature range 20 to 100°C lies between 67.5×10^{-6} and 91.6×10^{-6}. It is suggested that the thermal expansion of polymers is affected not only by polar groups but also by other factors, such as the length and flexibility of the main and side chains. The relative expansions of crystalline polymers also showed hysteretic behaviour both in the relative expansion and the expansion coefficient. A characteristic property of crystalline polymers is the fact that the expansion coefficient

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E032/E455

Thermal Expansion of Polymers

returns to its original value after about ten hours. There are 6 figures and 2 references: 1 Soviet and 1 non-Soviet.

SUBMITTED: May 12, 1960

Card 4/4

ANIKEYENKO, V.M.; KEVROLEVA, K.M.; KESSENIKH, R.M.; SOTNIKOV, V.G.

Conductance and dielectric loss in polyvinyl chloride plastics. Izv. vys. ucheb. zav.; fiz. no.5:75-80 '62. (MIRA 15:12)

1. Tomskiy politekhnicheskiy institut imeni S.M. Kirova.
(Polymers—Electric properties)
(Dielectric loss)

15.8050

40785
S/110/62/000/006/001/002
I010/I210

AUTHORS: Anikeyenko, V. M., (Engineer) Kevroleva, K. M., Kessenikh, R. M. Cundidater for Medical Science and Sotnikov, V. (Engineer)

TITLE: Radiation-damage stability of polynviylchloride plastics of insulation and jacket prescriptions

PERIODICAL: Vestnik elektro-promyshlennosti, no. 6, 1962, 16–20

TEXT: 6 insulation type and two jacket type plastics (all prescriptions given in a table) were irradiated with doses from 0 to 220 × 10^6 rad. The results of the measurements of the electrical and mechanical properties of irradiated samples presented in graphs, show that a substantial decrease of tensile strength and of the respective elongation of the plastic starts at 5 × 10^6 rad. The biggest change of σ_r occurs in the region from (5 + 50) × 10^6 rad. At a dose of 150 × 10^6 the tensile strength of a plastic containing 40% of plasticizer, decreased by 20% of its initial value; whereas that containing 60% of plastificator by 60% of the initial tensile strength. Irradiation causes chemical changes of the structure and therefore the resistivity decreased at 150 × 10^6 rad. to 3–37% of the initial one. At a total dose of 10^6 rad. the temperature-frequency change of the tg δ was about a 200% increase. The frost-resistance of the polyvinylchloride plastic decreases starting from the dose of 15 × 10^6 rad. The decomposition temperature starts decreasing from 5 to 15 × 10^6

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rad. Structure changes appear at 150 × 10^6 rad. The best results have shown the materials of prescriptions 224 and 489 containing tricresyl phosphate as plasticizer. No improvement of physico-chemical characteristics of polyvinylchloride plastics under irradiation up to 150 × 10^6 rad. was observed. The X-ray structure analysis data show more regularity of the structure of the polymer's chains. There are 10 figures and 1 table.

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ANIKEYENKO, V.M., inzh.; KEVROLEVA, K.M., kand.tekhn.nauk; KESSENIKH, R.M., kand.tekhn.nauk; SOTNIKOV, V.G., inzh.

Radiation resistance of the polyvinyl chloride plastic material of insulation and hose compoundings. Vest.elektroprom. 33 no.6:16-20 Je '62. (MIRA 15:7)
(Electric insulators and insulation)

ANIKEYENKO, V. M.; KEVROLEVA, K. M.; KESSENIKH, R. M.; SOTNIKOV, V. G.

Thermophysical characteristics of polyvinyl chloride plastics.
Izv. vys. uch. zav.; fiz. 3:121-123 '62.
(MIRA 15:10)

1. Tomskiy politekhnicheskiy institut imeni S. M. Kirova.

(Ethylene—Thermal properties)

ANIKEYENKO, V. M.; KEVROLEVA, K. M.; KESSENIKH, R. M.; SOTNIKOV, V. G.

Thermal aging of a polyvinyl chloride plastic. Izv. vys. uch. zav.; fiz. 3:149-152 '62. (MIRA 15:10)

1. Tomskiy politekhnicheskiy institut imeni S. M. Kirova.

(Vinyl compound polymers—Thermal properties)

KESSENIKH, R.M.; PETROV, A.V.; POPOV, V.A.; IGNATINSKIY, V.P.; SIROTKINA, Ye.Ye.

Dielectric losses of polar polymers based on carbazole. Vysokom. soed. 7 no.2:328-332 F '65. (MIRA 18:3)

KESSENIKH, R.M.; SOTNIKOV, V.G.; TRIPEL', V.G.; PETROV, A.V.; POKHOLKOV, Yu.P.; SHUMILOV, Yu.N.

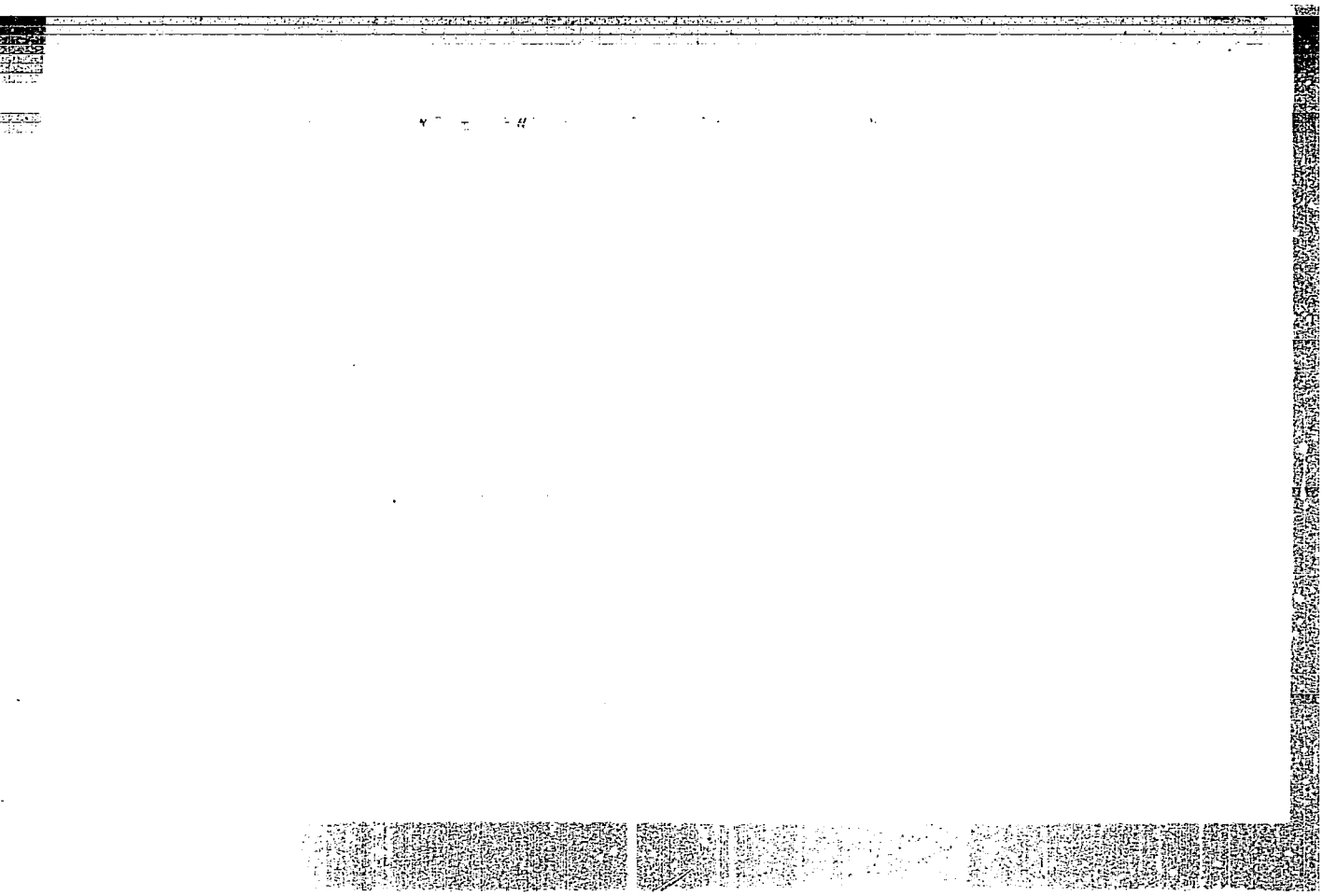
Some electrophysical properties of the homolog series of novolak-type phenol-formaldehyde resins. Izv. TPI 126:26-35 '64. (MIRA 18:7)

KESSENIKH, R.M.; SOTNIKOV, V.G.; TRIPPEL', V.G.; SHUMILOV, Yu.N.; POVELICHENKO, A.P.; [illegible]RIZHEVA, Yu.G.

Effect of plasticization on the physical properties of polyvinyl chloride resin. Izv. TPI 126:36-45 '64. (MIRA 18:7)

KESSENIKH, R.M.; TRIPPEL', G.V.

Plasticizing properties of some carbazole derivatives. Izv. TPI 126:117-122 '64. (MIRA 18:7)



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L 17783-66 EWT(m)/EWP(j) RM

ACC NR: AR5020054 SOURCE CODE: UR/0081/65/000/012/S058/S058

AUTHOR: Kessenikh, R.M.; Sotnikov, V.G.; Trippel', V.G.; Shumikov, Yu.N.; Gruzdeva, Yu.G.; Povelichenko, A.P.

ORG: none

TITLE: Effect of plasticization on the physical properties of polyvinylchloride tar

SOURCE: Ref. zh. Khimiya, Abs. 12B344

REF SOURCE: Izv. Tomskogo politekhn. in-ta, v. 126, 196 , 36-

TOPIC TAGS: polyvinyl chloride, plasticizer, electric property, vinyl plastic, brittleness, thermal stress

TRANSLATION: A study was made of the effect of low-molecular ... plasticizers (PL) from dioctylphtalate (DOP) and dibutylsebacinate (DBS) on the ... and electric properties of polyvinylchloride (PVC). It was established that PL affects the maximum of dipole elasticity losses and when the content of PL is considerable it displaces the maximum to lower temperature areas and decreases its value; the effect on PVC produced by DBS is stronger than that of DOP. There is a considerable PL effect at 20° on the resistance of specific volume in plasticized PVC when the compound contains ≥20% of PL. The greatest effect is achieved by DBS, lowering the specific volume resistance by 3 points, as compared to pure PVC. If the compound contains 50% of DBS, the specific volume resistance goes down by 5 points and is further lowered at higher

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ACC NR: AR5020054

temperatures. The introduction of PL lowers the embrittlement temperature (ET): with a content of 5% of PL in the compound, as referred to the ET of PVC, the ET equals 20°; with a 50% content of PL in the compound, the ET equals [illegible]°. DOP and DBS have an almost identical effect on the thermal expansion and the ET in PVC plastics. By means of a roentgenographic analysis it was established that the introduction of PL into PVC ($\leqslant$20%) stimulates a better ordered structure of the material; however, a further increase of PL (50%) will disturb the order of the compound structure.

SUB CODE: 07

Card 2/2 vmb

ACC NR: AP7013136 SOURCE CODE: UR/0139/66/000 006/0141 0143

AUTHOR: Kessenikh, R. M.; Pokholkov, Yu. P.; Petrov, A. V.

ORG: Tomsk Polytechnical Institute im. S. M. Kirov (Tomskiy politekhnicheskiy institut)

TITLE: Peculiarities of thermal aging of epoxide compound of hot hardening

SOURCE: IVUZ. Fizika, no. 6, 1966, 141-143

TOPIC TAGS: thermal aging, epoxy resin, phthalic anhydride, hardening, thermal stability

SUB CODE: 11,07

ABSTRACT: It has been established for some time that with such dielectrics as polystyrol, polyethylene-terephthalate, and others which have bulky groups in their structures such as a benzene ring, $COOCH_3$ group, etc, the dependence of the specific resistance on the temperature passes through a minimum in the region of the temperature of vitrification. A minimum temperature for the specific resistance of polymers is explained by superimposing the polarization current on the conductance current (B. I. Sazhin; "Dependence of Electric Conductance of Polymers on the Temperature;" Vysokomolekulyarnyye Soyedineniya No 6, 1961).

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ACC NR: AP7013136

APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000721610013-0"

In this article, the authors discover similar laws governing the hot hardening of an epoxide compound containing 100 parts by weight of ED-6 resin and 60 parts by weight of phthalic anhydride. The hardening took place over a 24-hour period at a temperature of 140°C. Thermal stability of the compound obtained was 120°C. A minimum temperature was found for the specific resistance of a pure thermo-reactive epoxide compound which shifted into the region of higher temperatures as the aging continued. Orig. art. has: 2 figures. [JPRS: 40,207]

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PROCESSES AND PROPERTIES INDEX

KESSENIKH, V. [redacted] N.

5A

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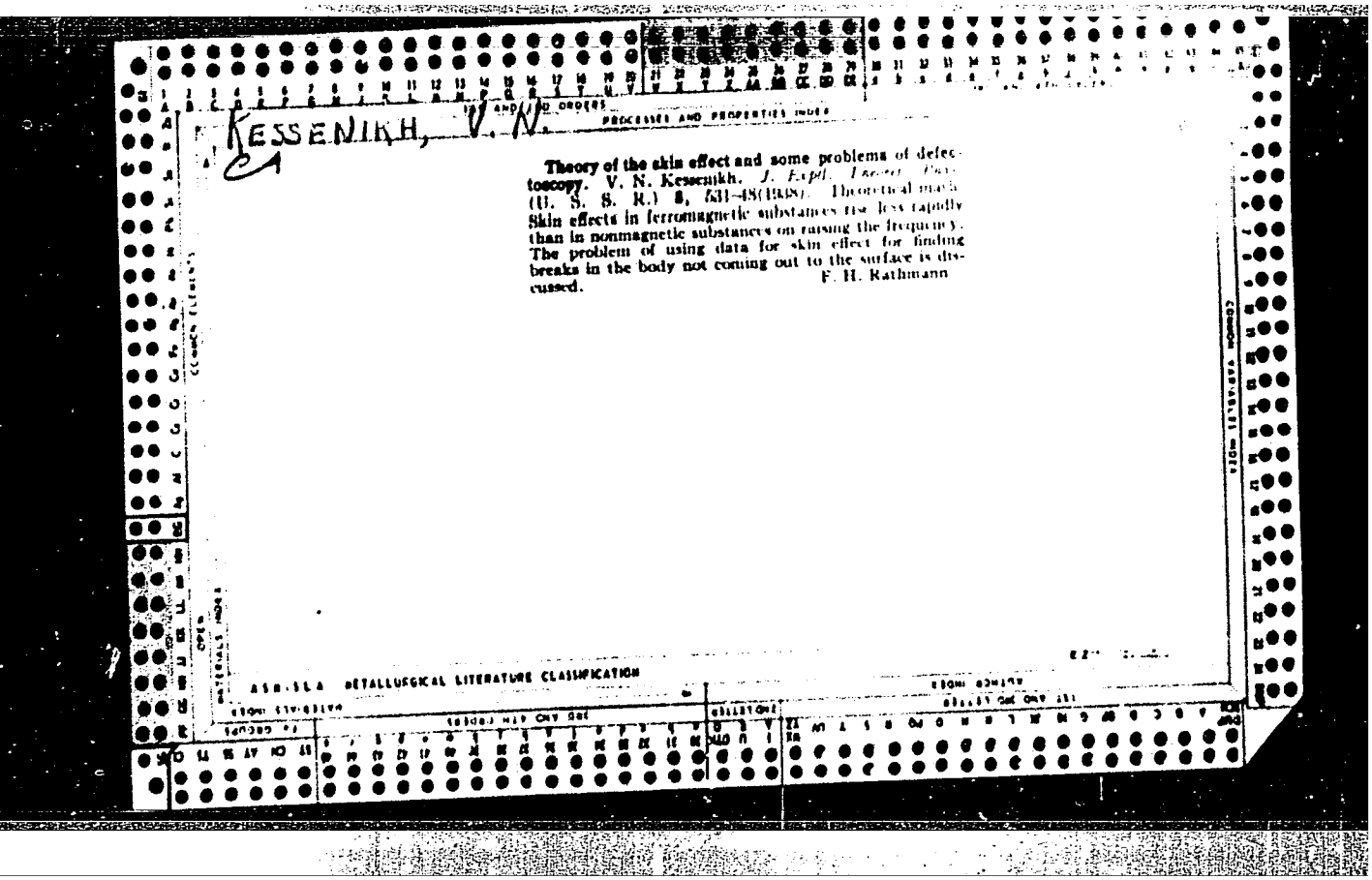
2969. **Ionosphere Observations during the Total Eclipse of the Sun, June 19th, 1936.** V. Kessenikh, H. Beerwald, N. Bulatov, and V. Denisov. *Techn. Phys., U.S.S.R.*, 4, 6, pp. 466–484, 1937.—*In English.*—These observations were carried out by the Siberian Physico-Technical Institute, Tomsk ($\phi = 56°28'\cdot1$(N); $\lambda = 84°56'\cdot2$(E)) between June 18th and June 24th, 1936. Particular attention was given to the examination of the F_2- and D-regions. The measurements of critical frequency and absorption showed a reduction of F_2-ionisation at the time of the supposed corpuscular eclipse of particles with velocities of 1600–2000 km./sec.; decrease of ionisation of the F_2- and D-layers also took place during the period of the optical eclipse. The eclipse of June 19th, 1936 took place at a period of intensive magnetic storms caused by an increase in solar activity. Rapid fluctuations of solar radiation were superimposed upon the effect of the eclipse, thus apparently intensifying the effects of the corpuscular eclipse. The main conclusions from the observations may be summarised as follows: it is once more confirmed that u.v. solar radiation plays an important part in the ionisation of the F_2-region; it is established that u.v. radiation is largely responsible for the ionisation of the absorbing D-region; the existence of a pronounced effect of solar corpuscles on the ionisation of the F_2-region is made highly probable. AUTHORS.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



KESSENIKH, V. N.

Theory of the skin effect and some problems of defectoscopy. V. N. Kessenikh. *J. Exptl. Theoret. Phys.* (U. S. S. R.) 8, 431–48(1938). Theoretical study. Skin effects in ferromagnetic substances rise less rapidly than in nonmagnetic substances on raising the frequency. The problem of using data for skin effect for finding breaks in the body not coming out to the surface is discussed.
F. H. Rathmann

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

KESSENIKH, V. N.

"On the Case of the Propogation of Radio Waves in the Ionosphere," Dokl. AN SSSR, 22, No.7, 1939

KESSENIKH, V. N.

"On the Characteristic Impedence of a Long Single Wire Line," Dokl. AN SSSR, 27, No.6, 1940

KESSENIKH, V. [redacted] PROCESSES AND PROPERTIES INDEX

5A

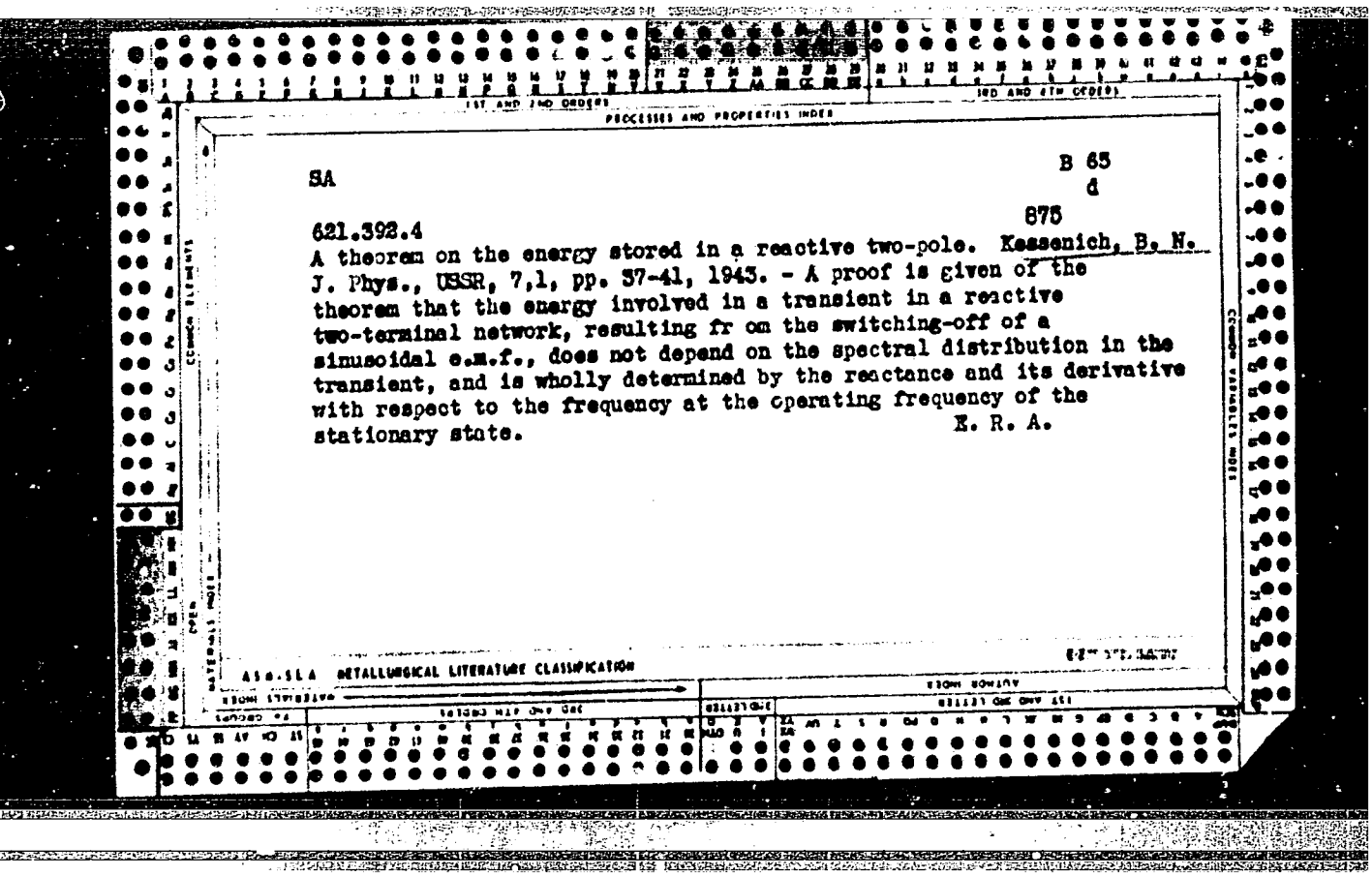
B 66

621.396.611.1

341

Energy relations in oscillatory systems and parameters of radiating systems. Kessenich, V. *J. Phys. U.S.S.R.*, 4, 1-2, pp. 123-142, 1941.—From a study of the energy relations of a number of different types of oscillatory systems it is shown that the field energy of a radiating system can be divided into 2 parts, one being the finite energy of the system itself and the other the radiated energy of the field. It is suggested that in treating the intensity and duration of transient processes in oscillatory systems one should apply, on the basis of the definition of stored energy, generalized time constants. In simple cases this new concept is the ordinary time constant or damping coefficient; it replaces the latter outside their range of applicability. A. W.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



PROCESSES AND PROPERTIES INDEX

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621.392.4
A theorem on the energy stored in a reactive two-pole. Kessenich, B. N. J. Phys., USSR, 7,1, pp. 37-41, 1943. - A proof is given of the theorem that the energy involved in a transient in a reactive two-terminal network, resulting fr om the switching-off of a sinusoidal e.m.f., does not depend on the spectral distribution in the transient, and is wholly determined by the reactance and its derivative with respect to the frequency at the operating frequency of the stationary state.
E. R. A.

A 56.5 L A METALLURGICAL LITERATURE CLASSIFICATION

KESSENIKH, V. N.

"Energy Relations in Oscillatory Systems and Parameters of Radiating Systems," Zhur. Fiz. USSR, 4, Nos. 1-2, pp 123-42, 1941

2542. AN ESTIMATION OF THE INTEGRAL ABSORPTION IN THE IONOSPHERE ACCORDING TO MEASUREMENTS OF THE STRENGTH OF VERTICAL FIELD.—V. N. Kessenikh. (*Journ. of Phys* [of USSR], No. 6, Vol. 8, 1944, p. 383: in English, summary only: in full in No. 4 of *Bull. de l'Ac. des Sci. de l'URSS, Série Physique*, 1944.)

"The experimental results are compared with the values of the field obtained by computing the radiation of a dipole placed between two conducting surfaces. It is shown that the corresponding formulae can be applied to estimate the coefficient of reflection of the ionosphere by using the results of measurement of the field strength. Evidence pointing to an increase of the absorption coefficient with increasing area of the sun spots is also given.

"It also follows from the experimental data that in those cases, in which the working frequency of layer E is close to the critical, no minimum of the field strength should be observed; this may be due to the significant rôle played by partial reflection from the lower boundary of layer E."

KESSENIKH, V. N.

621.396.11 : 551.51.053.5 3014

Maximum Values of Radio Field Intensity on Vertical Reflection from the Ionosphere, and an Evaluation of the Coefficient of Reflection. V. N. Kessenikh. (*Bull. Acad. Sci. U.R.S.S., sér. phys.*, 1944, Vol. 8, No. 2, pp. 68-75. In Russian.) Complete paper, of which an English summary was abstracted in 2522 of 1945.

KESSENIKH, V. N.

"An Estimation of the Integral Adsorption in the Ionosphere According to Measurements of the Strength of Vertical Field," Zhur. Fiz., 8, No.6, p. 383, 1944

KESSENIKH, V. N.

"The Theorems Concerning the Energy Stotage of a Reactive Double Pole," Zhur. Tekh. Fiz., 14, Nos. 7-8, 1944

W.E.

Propagation of waves

2530. THE CONTINENTAL EFFECT IN THE GEOGRAPHIC DISTRIBUTION OF THE ELECTRON CONCENTRATION IN THE F_2 LAYER.—V. N. Kessenikh & N. D. Iliukatov. (*Comptes Rendus (Doklady) de l'Acad. des Sci. de l'URSS*, 30th Nov. 1944, Vol. 43, No. 6, pp. 234-237: in English.)

"Without entering into a discussion on the nature of the seasonal changes in the electron concentration in the F-layer, one must acknowledge the following firmly established facts: (i) the average value of daily maxima of the electron concentration in the F_2 layer during the winter half of the year is higher than its average value during the summer half. This holds true both for the northern and southern hemispheres, though the seasonal difference for the latter is less pronounced. (ii) The increase in the average values of daily maxima of the electron concentration in the F_2 layer corresponds to the seasonal fall in the average temperature and rise in pressure in the troposphere. One is not permitted to assume that there is a direct causal relation between the seasonal changes in temperature, pressure and electron concentration. The possible considerations on the distribution of density and temperature with altitude are as yet too speculative in character to employ them to explain observed phenomena . . .

"In spite of incompleteness of the theory, the peculiarities in the seasonal course of the electron density in the F_2 layer may be regarded as regularly connected with the thermodynamics and aerodynamics of the atmosphere, and manifestation of these same regularities should be sought for not only in the seasonal change in the electron concentration, but in its geographic distribution as well.

"Already in 1935 Martyn & Pulley (317 of 1936) established the indicants of the correlation between the barometric pressure at the ground level and the critical frequency of the F_2 layer . . . More definite data on the correlation between meteorological processes and the critical frequencies of the F_2 layer were obtained by Hannon and others (2142 of 1940) during an analyses of synoptic charts of meteorological data in the region where the critical frequencies were measured (Australia). . . . A comparison of F_2 critical-frequency data obtained at Tomsk since 1936, with data from other ionospheric stations and with the climatic conditions of these stations, gives ground for asserting that the seasonal effect in the change of the electron concentration of the F_2 layer appearing in time is connected with a similar effect of climatic conditions in the geographic distribution

(over)

1945

KESSENIKH, V. N. PA 8T113

USSR/Ionosphere Feb 1947
Heaviside layer

"Evolution of Views on the Structure of the Ionosphere," V. N. Kessenikh, 8 pp

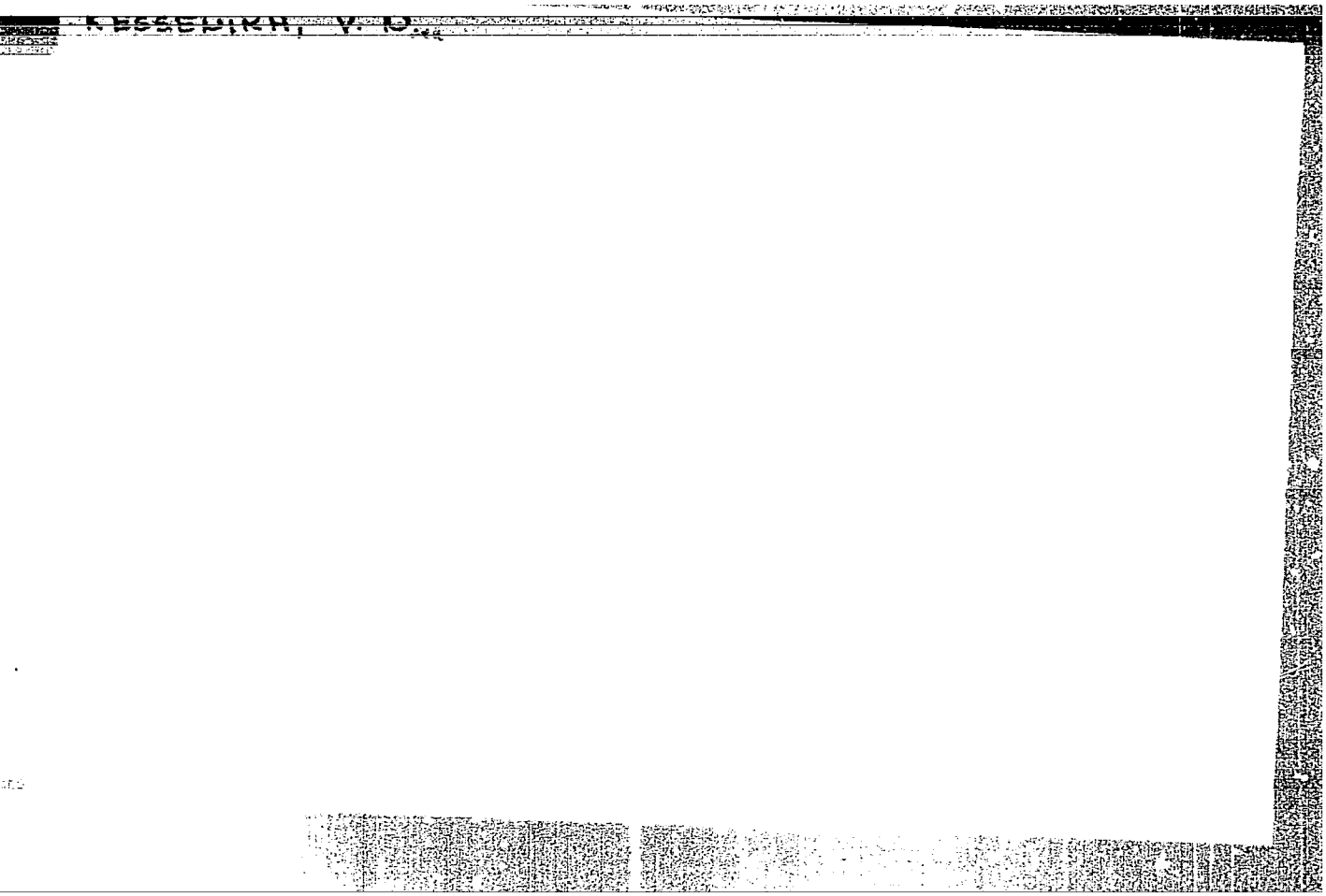
"Izv Ak Nauk Fiz" Vol XI, No 2 p. 155

Brief account of some of the most substantial contradictions and gaps in the conception of the structure of the ionosphere as revealed by data gathered in current observations.

8T113

KESSENIKH, V.N.; GUSEV, V.D., redaktor; DRACHEV, L.A., redaktor.

[Propagation of radio waves] Rasprostranenie radiovoln. Moskva, Gos. izd-vo tekhniko-teoret. lit-ry, 1952. 488 p. (MLRA 7:6)
(Ionospheric radio wave propagation)



[redacted], V. N.

The Committee on Stalin Prizes (of the Council of Ministers USSR) in the fields of science and inventions announces that the following scientific works, popular scientific books, and textbooks have been submitted for competition for Stalin Prizes for the years 1952 and 1953. (Sovetskaya Kultura, Moscow, No. 22-40, 20 Feb - 3 Apr 1954)

Name	Title of Work	Nominated by
Kosenniki, V.N.	"Radio Wave Propagation"	Tomsk State University

SO: W-30604, 7 July 1954

KESSENIKH, V.N.

Answer to V.L.Ginzburg's article concerning the book "Radio wave propagation." Zhur.eksp. i teor.fiz. 27 no.4:510-516 O '54.
(MLRA 7:12)

1. Sibirskiy fiziko-tekhnicheskiy institut.
(Radio waves) (Ginzburg, V.L.)

KESSENIKH, V.N.

USSR/ Physics Radio wave propagation

Card : 1/1 Pub. 118 - 7/7

Authors : Getmantsev, G. G., Zhevakin, S. A., Kobrin, M. M., and Miller, M. A.

Title : Propagation of radio waves

Periodical : Usp. fiz. nauk 53/2, 298 - 303, June 1954

Abstract : The book "Propagation of Radio Waves", written by V. N. Kessenikh, is criticized. Many fundamental errors in interpretation of the subject covered by the book were found. Also, the unmethodical arrangement of many experimental data, included in the book, render it useless even for reference. In short, the publication of the book by the "Gostekhizdat" (State Publ. House for Tech. Literature) is considered to be erroneous.

Institution : ....

Submitted : ....

KESSENIKH, V.N.

[redacted]

ON THE LONG-PERIOD PHOSPHORESCENCE-EXCITING
REGIONAL CONNECTIONS AND THE SYNOPTICAL REVELATION
OF THEM

Report presented at the CSAGI meeting, [illegible], Moscow.

80576

9.9100 SOV/169-59-7-7471

Translation from: Referativnyy zhurnal, Geofizika, 1959, Nr 7, p 145 (USSR)

AUTHOR: Kessenikh, V.N.

TITLE: The Neutron Decay and the Residual Concentration of Electrons in the F2-Layer of the Ionosphere

PERIODICAL: Tr. Sibirsk. fiz.-tekhn. in-ta, 1958, Nr 36, pp 361 - 363

ABSTRACT: The steady existence of the residual electronic concentration in the nightly F2-layer makes one to pay attention to possible sources of a supplementary ionization (SI) in the F2-layer. In order to sustain the nightly concentration level of electrons, a rate of ion generation of the order of 0.1 pairs/cm^3.sec is required. The UV-radiation of stars and the primary cosmic radiation are considered as the possible sources of the SI. The flux of stellar photon energy turns out to be at least 10,000 times weaker than the required quantity. The primary cosmic radiation can generate only 10^{-7} ion pairs per second. The author proposes the thesis according to which the SI is generated by the electrons emerging from the β-decay of neutrons entering

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80576

SOV/169-59-7-7471

The Neutron Decay and the Residual Concentration of Electrons in the F2-Layer of the Ionosphere

the F-region of the ionosphere from the troposphere, where the latter are generated by nuclear reactions due to cosmic rays. These electrons move in the magnetic field of the earth along the helices. The electrons having an energy of about 0.5 Mev can generate along their path 1.15 pairs of ions per second. The quantity of these electrons can turn out to be sufficient for sustaining the minimum level of the residual electronic concentration. The data on the correlation of intensity of the neutron component of the cosmic radiation in the troposphere with the ionization level of the nightly F2-layer can be used for the verification of this hypothesis.

L. Shch.

Card 2/2

3(0),7(7)

AUTHOR: Kessenikh, V. N.

SOV/20-123-1-14/56

TITLE: On the Possible Methods of Measuring the Concentration of Slow Neutrons in the Layer F_2 of the Ionosphere (O vozmozhnykh putyakh izmereniya kontsentratsii medlennykh neytronov v sloye F_2 ionosfery)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 123, Nr 1, pp 57-59 (USSR)

ABSTRACT: One of the bases for raising the problem of slow neutron concentration in the F_2 layer of the ionosphere is the hypothesis of the partial remanent nocturnal ionization of this layer under the influence of the β- decay of neutrons. Estimates showed that with a neutron concentration of the order 1 cm^{-3} the β-electrons produced by neutron decay (which have an average energy of 0.5 MeV) are captured by the terrestrial magnetic field. They move on screw-shaped paths having a radius of up to 70 m and are able to produce up to $1.5.10^4$ secondary electrons per primary β-electron. In the case of neutron concentrations of 1 cm^{-3} and a half-life of 270 sec, 10^{-3} primary electrons (with an energy of 0.5 MeV) can be produced per cm^{-3}.

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The lowest intensity limit of this ionization caused by the β-decay of neutrons in the F_2 layer is of the order of 0.1 pairs $cm^{-3}.\ sec^{-1}$ per 1 neutron in 1 cm^3. The existence of an ionization source of this intensity must make a measurable contribution towards ionization of the F_2 layer if the most important ionizing factor, the solar photon radiation, is lacking (nocturnal sky). The equilibrium value of the electron concentration corresponding to the ionization intensity 0.1 $cm^{-3}.sec^{-1}$ amounts to $2.2.10^4$ electrons in 1 cm^3. To this concentration there corresponds the critical frequency of 1.3 megacycles. The lowest values (averaged for one month) of the nocturnal minimum of the critical frequencies of the F_2 layer (for an ordinary beam) were observed in January 1943; they did not decrease below the value of 2.0 megacycles. These values were measured at Tomsk. The values of the nocturnal minimum $f^o_{F_2}$ measured in individual nights of January 1943

amounted to 0.9 megacycles. If the ionosphere is considered to be an ionization chamber in which electron concentration is measured by means of radiophysical methods, it may be said that the observed remanent nocturnal ionization indicates the existence of a hitherto unknown ionization source. If β-decay is considered to be the source of this ionization, this assumption must be verified by immediate measurement of neutron concentration by employing the direct methods of detection and by counting the slow neutrons. A short report is given on such measurements carried out by various authors. Various considerations indicate the possibility of measuring neutron concentrations of up to 10^{-7} cm^{-3} by means of unshielded counters with BF_3, which are conveyed into the upper atmosphere.

It is of great importance for the investigation of the dynamics of the neutron component of the terrestrial atmosphere and its possible influence on the remanent ionization of the ionosphere to obtain immediate data concerning neutron concentration in the upper atmosphere.

On the Possible Methods of Measuring the Concentration of Slow Neutrons in the Layer F_2 of the Ionosphere

SOV/20-123-1-14/56

There are 8 references, 7 of which are Soviet.

PRESENTED: May 28, 1958, by V. D. Kuznetsov, Academician

SUBMITTED: May 22, 1958

Card 4/4

89078
S/169/61/000/001/006/011
A005/A001

9.9100

Translation from: Referativnyy zhurnal, Geofizika, 1961, No. 1, p. 12, # 1G120

AUTHOR: Kessenikh, V. N.

TITLE: Propagation of Radiowaves and the Physics of the Ionosphere

PERIODICAL: Tr. Sibirsk. fiz.-tekhn. in-ta pri Tomskom un-te, 1959, No. 37, pp. 10-15

TEXT: The author gives a concise summary of the works on the propagation of radiowaves and the physics of the ionosphere, which were published by 1956. It is stated that the ambiguity of the deciphering of ionograms and the absence of reliable data on the molecular and atomic compcsition of the ionophere lead to the necessity of rocket sounding of the ionosphere. The reception of signals emitted from the moving rocket and coordinated in frequency as well the investigations by the method of injection of extraneous gas masses are of special importance. It is noted that the rocket research complements essentially radiophysical methods, but the development and the improvement of the latter remains the priority problem in the study of the upper atmosphere. The special actuality of the works is emphasized in connection with the study of the scattering of the pulse signals

Card 1/3

Propagation of Radiowaves and the Physics of the Ionosphere

in the ionosphere, the scattering by the meteor trails, and the phenomena caused by the diffraction of the signals by inhomogeneities of the ionosphere, which are statistically distributed, changing with time, and moving in space. It is noted that the problem of the nature of reflections with the apparent value of reflection coefficient $R > 1$ occupies a peculiar place among the problems of the methods of ionospheric observations. The investigations of idealized ways of propagation in the ionosphere and of the peculiarities of propagation in a gyrotropic medium occupy a large place in the group of the theoretical works. The graphical and graphoanalytical methods of investigation of the course of rays in the ionosphere are applied successfully. The works published showed that the events of triple splitting of reflected signals are correlated with large values of the gradient of electronic concentration in the F2-region near the maximum of the layer. The possibility of the stable existence of large gradients of electronic density in the ionosphere becomes obvious when considering the abipolar diffusion with allowance for the effect of the geomagnetic field. Valuable results are mentioned from the investigation of the diffusion in the ionosphere which were obtained by V. M. Polyakov (Irkutsk). It is shown that the development

89078

S/169/61/000/001/006/011
A005/A001

Propagation of Radiowaves and the Physics of the Ionosphere

of the theory of magnetohydrodynamical phenomena in plasma led to the substantiation of the hypothesis on the stable existence of inhomogeneities of plasma in the ionosphere. The small quantity of scientific data on the problem of the effect of the troposphere on the propagation of short waves is pointed out. There are 31 references.

E. Kazimirovskiy

Translator's note: This is the full translation of the original Russian abstract.

Card 3/3

S/169/61/000/010/048/053
D228/D304

AUTHOR: Kessenikh, V. N.

TITLE: Role of beta- and delta-electrons in the electron concentration of the F2-layer

PERIODICAL: Referativnyy zhurnal, Geofizika, no. 10, 1961, 32-33, abstract 10G196 (Tr. Sibirst. fiz.-tekhn. in-ta pri Tomskom un-te, no. 37, 1959, 330-340)

TEXT: The author develops the previously proposed hypothesis (RZhGfiz, no. 7, 1959, 7471) on the origin of fast electrons as a result of the beta-decay of neutrons and on the possibility of maintaining the F2-layer's nocturnal ionization at their expense. The expression for neutron concentration at a definite height is given together with the formula representing one model of the neutron layer in the upper atmosphere. The calculated distribution of neutron concentration in the ionosphere has a maximum at a height of 200 km. Different processes of the decay of cosmic particles

Card 1/2

Role of beta- and delta-electrons... S/169/61/000/010/048/053
D228/D304

and their role in the atmosphere's ionization are examined. 23 references.
[Abstracter's note: Complete translation.]

Card 2/2

SEASONAL AND EXPLOITATION SOV/5743

Akademiya nauk SSSR. Mezhduvedomstvennyy komitet po provedeniyu Mezhdunarodnogo geofizicheskogo goda. V. razdel programmy MGG: Ionosfera.

Issledovaniya ionosfery; sbornik statey (Ionospheric Researches; Collected Articles. No. 3) Moscow, Izd-vo AN USSR, 1960. 100 p. 2,000 copies printed.

Resp. Ed.: N. V. Mednikov, Candidate of Physics and Mathematics; Ed.: L. A. Trofimova; Tech. Ed.: T. V. Polyakova.

PURPOSE : This IGY publication is intended for geophysicists, astrophysicists, and other scientists concerned with the ionosphere and radio atmospherics.

COVERAGE: The collection of articles contains the results of investigations on the ionosphere and radio atmospherics, based chiefly on IGY observational data from USSR stations. The articles may be grouped into the three following categories:

Card 1/5

24,2120

S/139/60/000/01/039/041
E192/E382

AUTHOR: Kessenikh, V.N.

TITLE: Coherent Scattering in Plasma

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Fizika, 1960, Nr 1, pp 234 - 235 (USSR)

ABSTRACT: When the radiation of a dipole source is scattered by the electrons of plasma, apart from the noncoherent scattered radiation which is characterised by a statistical amplitude and phase distribution, there can always exist a stationary or a slowly-changing field component which is due to a coherent superposition of the fields radiated by the stationary component of the electron concentration. this is independent of the thermal motion and the free path of the electrons in plasma. The condition of the appearance of a secondary field with a stationary or a slowly-changing complex amplitude is analysed for the case when $\omega_p/\omega \ll 1$ and $\omega_H/\omega \ll 1$; ω_p is the plasma frequency and ω_H is the cyclotron frequency. The secondary field produced by an elementary volume dV of the region having an electron concentration n at the

Card1/3

Coherent Scattering in Plasma

observation point F_2, which is situated at a distance r_r from the secondary radiator, is given by

$$d\vec{E} = \frac{\vec{p}_o k^2}{r_t} \frac{r_e}{r_r} e^{ik(r_r + r_t)} \, nd \, V \qquad (1)$$

where r_e is the classical radius of an electron
$\vec{p}_o$ is the amplitude of the electric dipole and
$k = \omega/c$.

In Eq (1) it is assumed that the observation point F_2 is situated in the equatorial plane of the primary dipole source and that the distance between the secondary radiator and the primary source is r_t. The primary field in Eq (1) can be expressed as $\vec{E}_o = \vec{p} k^2/r_t$. Assuming that $r_t + r_r = 2r$, the first Fresnel zone at a distance r

Card2/3

69460

S/139/60/000/01/039/041
E192/E382

Coherent Scattering in Plasma

from F_2 is given by Eq (2), where $\Theta = \gamma/2$ and γ is the angle of scattering. On the basis of Eq (2) the power of the coherent component at the point F_2 is expressed by:

$$P_{rc} = \frac{E_o^2 \pi^2}{32} r_e^2 n^2 \frac{\lambda^4}{\sin^4 \Theta} \qquad (3).$$

There are 2 references, 1 of which is English and 1 Soviet.

ASSOCIATION: Sibirskiy fiziko-tekhnicheskiy institut pri Tomskom gosuniversitete imeni V.V. Kuybysheva (Siberian Physico-technical Institute of Tomsk State University imeni V.V. Kuybyshev)

SUBMITTED: September 5, 1959

Card 3/3

ACCESSION NR: AT3012751 S/2831/60/000/002/0033/0039

AUTHOR: Kessenikh, V. N.

TITLE: Possible mechanisms for the connection between the synoptics of the ionosphere and the troposphere

SOURCE: AN SSSR. Mezhduvedomst. komit. po prov. Mezhdunarodn. geofizich. goda. 5 razdel program. MGG: Ionosfera. Sb. statey, no. 2, 1960, 33-39

TOPIC TAGS: ionosphere, troposphere, ionosphere synoptics, troposphere synoptics, ionospheric anomalies, tropospheric anomalies, climatic anomalies, international geophysical year, baric anomalies

ABSTRACT: After a brief historical review of the various theories on the relation between ionospheric and tropospheric data, and after a brief comparison of the results of observations made by the ionospheric network of the USSR in 1950--1952 (with emphasis on the

Card 1/3

ACCESSION NR: AT3012751

studies of the possible correlation between the climatic maps of the ionosphere and the troposphere as disclosed by the Siberian anomaly) the author recommends a program for the investigation of the correlation between the tropospheric and ionospheric synoptics so as to check whether original ionospheric anomalies of climatic character actually exist. This program should include compilation of averaged ionospheric synoptic maps as part of the IGY data reduction program with separation of the regional anomalies by the method of T. S. Kreblay (Dokl. IZMIRAN, No. 3, 13, 1948). Other parts of the program are a large-scale compilation of world synoptic maps of regional ionospheric anomalies and comparison with maps of baric anomalies, study of the possibilities of a detailed investigation of the processes of circulation from the troposphere to the ionosphere, using optical and radar observations of winds, and organization of a special symposium on problems in the theory of regional and local tropospheric-ionospheric connections. Orig. art. has: 2 figures and 1 table.

Card 2/3

S/194/62/000/005/107/157
D230/D308

AUTHOR: Kessenikh, V.N.

TITLE: Some problems of the theory of wave impedance of single-wire lines. Lecture at the scientific and technical conference of the Society im. A.S. Popov, Tomsk, May 7, 1960

PERIODICAL: Referativnyy zhurnal. Avtomatika i radioelektronika, no. 5, 1962, 22, abstract 5zh158 (Tr. Sibirsk. fiz.-tekhn. in-ta pri Tomskom un-te, 1960, no. 39, 81-93)

TEXT: Brief appraisal of the present state of the problem of calculation and practical application in engineering theory, of the quantity defined as the wave impedance of a single conductor. [Abstractor's note: Complete translation].

Card 1/1

S/904/61/000/000/001/011
D218/D308

AUTHOR: Kessenikh, V. N.

TITLE: Neutron β-decay as a factor in the ionization of the F2 layer

SOURCE: Doklady Nauchnogo simpoziuma po ionosfere, Rostov-na-Donu, 21-22 aprelya 1960 g. V razdel programmy MGG (ionosfera). Rostov on the Don, Izd-vo Rostov. univ., 1961, 8-10

TEXT: The contribution to the density of the F2 layer due to electrons originating from neutron decays is briefly discussed. Elementary calculations are said to show that a slow-neutron counter mounted on an artificial earth satellite should give a noticeable effect for neutron densities of $10^{-6} - 10^{-7}$ cm^3. It is recommended that, as soon as possible, satellite programs should incorporate the determination of the concentration of the neutron component in order to investigate the mechanism of

Card 1/2

accumulation and the distribution of charged particles in the upper atmosphere.

ASSOCIATION: Tomskiy gosudarstvennyy universitet (Tomsk State University)

S/904/61/000/000/002/011
D218/D308

AUTHOR: Kessenikh, V. N.

TITLE: Ionospheric climatology and IGY data

SOURCE: Doklady Nauchnogo simpoziuma po ionosfere, Rostov-na-Donu, 21-22 aprelya 1960 g. V razdel programmy MGG (ionosfera). Rostov on the Don, Izd-vo Rostov. univ., 1961, 11-13

TEXT: This work was carried out in accordance with the IGY program and has produced a new confirmation of the existence of regional geographic features in the behavior of the ionosphere. Results of preliminary analysis of the data, obtained at the stations listed below, show that for group B the level of critical frequencies of the F2 layer was considerably lower in the winter and considerably higher in the summer than for group A. Geographic regions with a clearly defined winter have higher winter-spring maxima in the F2 electron densities.

Card 1/3

Table. Maximum values of the monthly medians of the diurnal variation of the F2 critical frequencies

Group	Station	$f^0 F2_{max}$, Mc/sec			
		IX 1957	XII 1957	III 1958	VI 1958
A	Moscow	9.9	15.3	12.3	7.8
	Sverdlovsk	10.8	15.2	12.8	8.0
	Tomsk	10.7	14.2	13.0	8.1
	Irkutsk	11.1	13.8	14.0	8.1
B	Rostov	>10	>10	>10	9.2
	Alma-Ata	12.0	13.9	14.4	10.4
	Ashkhabad	13.9	13.9	14.2	10.8

Card 2/3

Ionospheric climatology... S/904/61/000/000/002/011
D218/D308

There is 1 table.

ASSOCIATION: Tomskiy gosudarstvennyy universitet (Tomsk State University)

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S/139/61/000/002/018/018
E073/E435

9.9130 (incl. 2305, 2705, 3105)

AUTHOR: Kessenikh, V.N.

TITLE: Neutron Disintegration as a Factor of Ionization of the Upper Atmosphere

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Fizika, 1961, No.2, p.176

TEXT: The existence of an unknown source of ionization was established from measurements made in 1956 of the level of electron concentration of the F_2 layer of the ionosphere during night-time. The author of this paper expressed the hypothesis (Ref.1-3) that the decomposition of neutrons, which penetrate into the atmosphere from zones at altitudes of 15 to 25 km, may play an important role in the ionization of the upper atmosphere. The hypothesis was that essentially the movement of the neutrons from the layer, in which they are generated during nuclear reactions caused by the interaction of particles of primary cosmic rays with the light nuclei of the lower atmosphere, is independent of the magnetic field and represents a mechanism of transmission of energy of the cosmic rays into the upper atmosphere. The electron and proton, formed during the β disintegration of the neutron, are

Neutron Disintegration ...

captured by the magnetic field of the Earth and during their movement along spiral orbits they will bring about the formation of free electrons, provided that the concentration of the gas particles is high enough, which it is in the F_2 region of the ionosphere. The same mechanism of injection of charged particles into the magnetic field of the Earth was considered by S.N.Vernov and A.Ye.Chudakov (Ref.6) as being the main source of protons with energies of the order of 100 MeV in the internal radiation belt of the Earth. It is of major interest to carry out broad investigations by direct measurement of the neutron fluxes and of the neutron concentration in the ionosphere. In earlier work (Ref.4 and 5: DAN SSSR, Vol.123, No.1, p.57, 1958) the author proposed using neutron counters fitted into artificial satellites for measuring the concentration of slow neutrons. Recently W.N.Hess and A.J.Starnes (Ref.7: Phys.Rev.Letters, 5, No.2, p.48, 1960. Ref.8: Journ. of Geoph.Res.,65, No.10,p.3107, 1960) published experimental results of investigation of the neutron fluxes in the ionosphere and in the exosphere measured during a rocket flight. Hess also expresses the view that the internal radiation belt is probably caused primarily by neutron

Neutron Disintegration ...

disintegration. However, the available experimental data are highly inadequate for making accurate calculations relating to the ionosphere. The diagram of the distribution of surfaces of equal frequency of neutron disintegration given in the paper of W.N.Hess (Ref.8) leads to a decomposition frequency at the level of the ionosphere of the order of 3×10^{-11} neutrons/cm^3/sec. Calculations made earlier by the author of this paper (Ref.4) were based on the assumption that the main source of ionization energy are β-electrons from neutron disintegration. The data of S.N.Vernov and A.Ye.Chudakov (Ref.6) relating to radiation belts and rocket measurement data of the neutron fluxes (Ref.7 and 8) indicate that neutrons with energies of the order of 100 MeV play an important role in the neutron energy spectrum. The protons formed as a result of disintegration of such neutrons have energies of the same order of magnitude. Elementary energy calculation shows that during the process of braking of a 100 MeV proton 10^6 delta-electrons are formed and, therefore, at the given frequency of neutron disintegration the number of free electrons forming per cm^3/sec will be of the order of 3×10^{-5}. For maintaining ionization of the F_2 layer observed during night-time, an

ionization intensity of the order of $0.1 \times 1 / cm^3 \cdot sec$ is necessary. Assuming that the neutron flux of the order of $1/cm^2 \cdot sec$ observed by Hess and Starnes (Ref.7) corresponds also to the thermal neutrons which are braked by the gravitational field of the Earth, the volume concentration of neutrons, and accordingly the disintegration frequency per unit of volume will be considerably higher. This confirms the necessity of carrying out direct measurements of the volume concentration of slow neutrons at altitudes of 200 to 500 km by means of counters fitted into artificial satellites, as was proposed by the author in his earlier work (Ref.4). There are 8 references: 6 Soviet and 2 non-Soviet.

n.b. This is a complete translation.

ASSOCIATION: Sibirskiy fiziko-tekhnicheskiy institut pri Tomskom gosuniversitete imeni V.V.Kuybysheva (Siberian Physicotechnical Institute at the Tomsk State University imeni V.V.Kuybyshev)

SUBMITTED: December 10, 1960

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38247
S/169/62/000/005/081/093
D228/D307

9.9100

AUTHOR: Kessenikh, V. N.

TITLE: Influence of the vertical heterogeneity of the earth's magnetic field on the ionosphere's high-frequency characteristics

PERIODICAL: Referativnyy zhurnal, Geofizika, no. 5, 1962, 25, abstract 5G182 (V sb. Ioncsfern. issledovaniya, no. 6, M., AN SSSR, 1961, 7-8)

TEXT: On the assumption that the electron concentration N depends parabolically, and the gyro frequency f_H depends linearly, on the altitude $[f_H = f_{H_o}(1 - \beta z)]$ the shift of the true altitude $|z^x|$, corresponding to the critical frequency of an extraordinary ray, is estimated. In the region of the flat maximum (the layer semithickness $z_m \sim 100$ km), when $\beta \sim 10^{-3}$ (which is due to the gradient of the magnetic field), $|z^x| \approx 0.1 z_m/\sqrt{A}$, where $A = 4N_m e^2/\pi m f_{H_o}$. For

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Influence of the ....

f_o = 3 Mc/s, f_{H_o} = 1.5 Mc/s and $|z^X|$ = 2.5 km, i.e. the limit of the ionogram errors is reached. At higher values of B, which are probable in the area of the current systems, considerable anomalies in the structure of ionograms are possible. This allows detailed investigations of the influence of the current systems' magnetic fields in the E-region upon the ionograms to be made. [Abstracter's note: Complete translation.]

Card 2/2

29624
S/142/61/004/003/005/016
E095/E382

9.3230 (1132, 1159)

AUTHOR: Kessenikh, V.N.

TITLE: Reflection of electromagnetic waves from lumped load in a single conductor

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiotekhnika, v. 4, no. 3, 1961, pp. 280 - 284

TEXT: The purpose of this paper is to derive equations in terms of network and long-line theory which give the secondary field arising at irregularities. In his previous work (Ref.1- Doctor Dissertations, TGU im. V.V. Kuybyshev), the author examined in general terms the secondary field at irregularities in a single conductor to justify the application of network and long-line theory to the systems of radiating conductors. The approach was based on the premise that the current and the longitudinal component of the electric field are continuous at the irregularity. In the present paper two cases are considered:
Case 1 - a circular, cylindrical conductor extends to infinity in the direction which is coincident with the axis of the

conductor. At the other end, a two-pole is connected between the conductor and infinitely large screen of infinite conductivity. It is assumed that the length of the load is short compared with the wavelength of the electromagnetic wave, which is TEM and travels along the conductor from infinity to the load. Under the above assumptions an expression is derived for current I':

$$I' = \frac{2I_o ZY_{a/\lambda}}{1 + ZY_{a/\lambda}} \qquad (5)$$

where I' is the current produced by the irregularity,
$2I_o$ is the current corresponding to the sum of the primary and reflected fields at the screen,
Z is the load impedance,
$1/2\ Y_{a/\lambda}$ is the characteristic admittance of the conductor.

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Reflection of ....

Case 2 is similar to Case 1 but the screen is omitted and the expression for I' becomes:

$$I' = \frac{I_o Z Y_{a/\lambda}}{2\left(1 + \frac{1}{2} Y_{a/\lambda} Z\right)} \qquad (7) .$$

These show that the expression:

$$\frac{1}{Y_{a/\lambda}} = Z_{a/\lambda} = 60 \left(\ln \frac{\lambda}{\pi a} - C \right) \Omega \qquad (4)$$

for the input admittance of a single conductor can be used in evaluating current distribution at the load-to-line junction.

Card 3/4

Reflection of ....

There are 3 figures and 12 references: 11 Soviet-bloc and 1 non-Soviet-bloc.

ASSOCIATION: Kafedra radiofiziki Tomskogo gos. universiteta im. V.V. Kuybysheva (Department of Radiophysics of Tomsk State University im. V.V. Kuybyshev)

SUBMITTED: September 21, 1960

Card 4/4

KESSENIKH, V. N.

The eminent Russian physicist Petr Nikolaevich Lebedev. Izv. vys. uch. zav.; fiz. 3:170-172 '62. (MIRA 15:10)

1. Tomskiy gosudarstvennyy universitet imeni V. V. Kuybysheva.

(Lebedev, Petr Nikolaevich, 1866-1912)

KESSENIKH, V. N.; KAZIMIROVSKIY, Ye. S.; NOVIKOVA, Yu. A.

"Atmosphere Dependence as Revealed by Some Mid-Latitude and Middle-Asian Station of USSR."

summary to be presented at 13th Gen Assembly, IUGG, Berkeley, Calif, 19-31 Aug 63.

KESSENIKH, V.N.; KOVALEVSKIY, A.F.

Ionization of the night ionosphere. Izv. vys. ucheb. zav.; fiz. no. 5:181-182 '63. (MIRA 16:12)

1. Sibirskiy fiziko-tekhnicheskiy institut pri Tomskom gosudarstvennom universitete imeni Kuybysheva.

L 43720-66 EWT(1)/FCC GW

ACC NR: AT6023734 SOURCE CODE: UR/2831/65/000/014/0141/0145

AUTHOR: Kessenikh, V. N.; Kazimirovskiy, E. S.; Novikova, U. A.

43 B+1

ORG: none

TITLE: Relation between ionospheric dynamics and atmospheric dynamics based on data of the Ural-Siberian, North Caucasian, and Central Asian stations during the IGY

SOURCE: AN SSSR. Mezhduvedomstvennyy geofizicheskiy komitet. V razdel programmy MGG: Ionosfera. Sbornik statey, no. 14, 1965. Ionosfernyye issledovaniya, 141-145

TOPIC TAGS: climatic influence, F layer, ionospheric drift, atmospheric ionization, solar activity

ABSTRACT: To determine whether there are climatic factors changing from year to year and causing uncorrelated regional changes of ionization of the F2 layer, the authors studied the statistical data from ionospheric stations collected during 1951-1960 and compared them with data on solar activity and mean monthly characteristics of the state of the troposphere and tropopause. On the basis of the IGY material (1958-1959) it was possible to compare, for each month, the maximal value of the monthly median of the diurnal course of f_0F2 for each of the stations, the mean monthly heights of the 200-mb surface in geopotential decameters, and

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the mean monthly pressure values reduced to sea level. The results of the comparison are grouped by stations in the Urals and Siberia and stations of the North Caucasus and Central Asia. The analysis of the ionospheric and tropospheric data and data on drift in the F2 layer of the ionosphere showed that uncorrelated regional changes of the maximal ionization of the F2 layer occur from year to year which are accompanied by regional changes of the characteristics of the troposphere and tropopause and changes of winds in the F2 layer. An analysis of the data on the solar cycle revealed a slight dispersion of the ionospheric data during minimal solar activity which permitted the authors to conclude that particular attention should be devoted during the International Quiet Sun Year to a correlation of regional ionospheric and tropospheric characteristics. Orig. art. has: 2 tables and 2 figures.

SUB CODE: 04/ SUBM DATE: none/ ORIG REF: 007

KESSL, J.

"Protection Against Damage Done by Game and Small Rodents in Forest Nurseries." p. 39.
(ZA SOCIALISTICKE ZEMEDELSTVI, Vol. 4, no. 1, Jan. 1954, Praha, Czechoslovakia)

So: Monthly List of East European Accessions, LC, Vol. 3, No. 5, May 1954/Unclassified

KESSL, J. ; VANEK, J. ; FANTA, B.

Indications of damage caused by game in forests. p. 7.

Vol. 7, 1954
PRACE VYZKUMNYCH USTAVU LESNICKYCH CSR.
Praha, Czechoslovakia

So: Eastern European Accession Vol. 5 No. 4 April 1956

KESSL, J.; FANTA, B.

Reason for the biting and gnawing of forest trees by game. p.85.
Ceskoslovenska akademie zemedelskych ved. SBORNIK. RADA LESNICTVI.
Praha. Vol. 28, no. 1, Feb. 1955

SOURCE: East European Accessions List, (EEAL), Library of Congress,
Vol. 4, No. 12, December 1955

KESSL, J.; FANTA, B.; RIBAL, M.

Protection of forest against damages caused by game. p. 340.
(Sbornik Rada Lesnictvi, Vol. 30, no. 4, April 1957. Praha, Czechoslovakia)

SO: MONTHLY List of East European Accessions (EEAL) LC, VOL. 6, no. 10, October 1957. Uncl.

KESSLER, A.

Calculating the heating of electric machinery using the method of equivalent thermal circuits. In German. p. 238. (ACTA TECHNICA, Vol. 1, No. 4, 1956, Praha, Czechoslovakia)

SO: Monthly List of East European Accessions (EEAL) LC, Vol. 6, No. 12, Dec 1957. Uncl.

CZECHOSLOVAKIA/Atomic and Molecular Physics - Heat D-6

Abs Jour : Ref Zhur - Fizika, No 4, 1959, No 5459

Author : Kessler Arnost
Inst : -
Title : One Dimensional Problem of Propagation of Heat in Heating of Plates and Rods of Finite Length Sources of Heat

Orig Pub : Aplikace mat., 1958, 3, No 3, 190-122

Abstract : No abstract

Card : 1/1

KESSLER, Arnost, RNDr., C. Sc.

Simple method of determining the rise of temperature in electric machines at various working cycles. El tech cas 13 no.2:65-82 '62.

1. Ceskoslovenska akademie ved, Laboratorium fyziky Slovenskej akademie vied, Bratislava, ul. Obrancov mieru 11.

KESSLER, A. (Chekhoslovatskaya Sotialisticheskaya Respublika)

Calculation of the heating of asynchronous motors during heavy start and braking by current reversal. Elektrichestvo no.6:12-17 Je '63. (MIRA 16:7)

(Electric motors, Induction)

KESSLER, Arnost, RNDr., ScC.

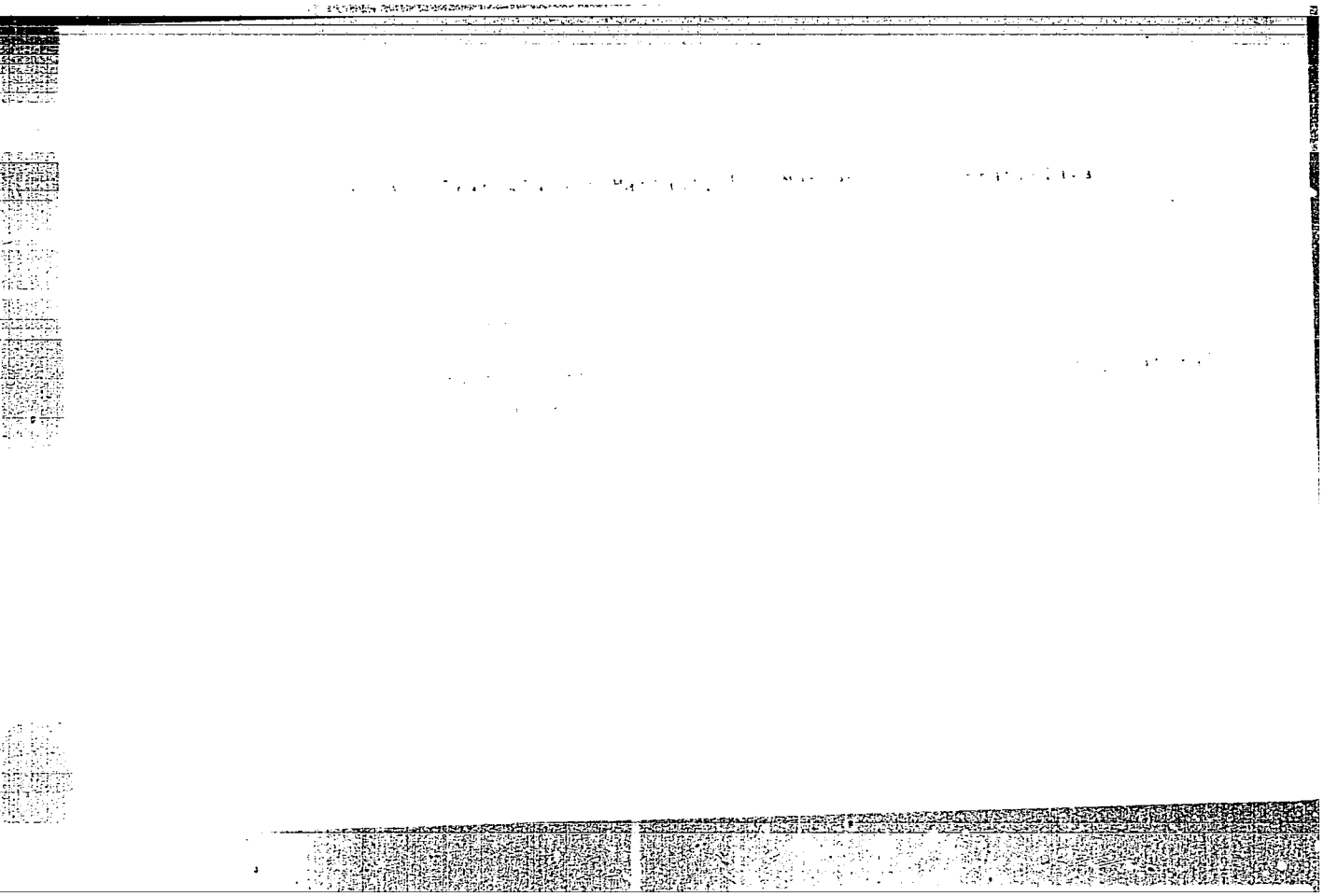
Use of a simple direct-current network for electric machine heating calculation. El tech cas 14 no.6:332-343 '63.

1. Laboratorium fyziky, Slovenska akademia vied, Bratislava, Dubravska cesta.

KESSLER, Arnost, RNDr.

Thermal resistance network as thermal model of electric machines.
El tech obzor 52 no.12:653-655 D '63.

1. Fysikalny ustav, Slovenska akademia vied, Bratislava.



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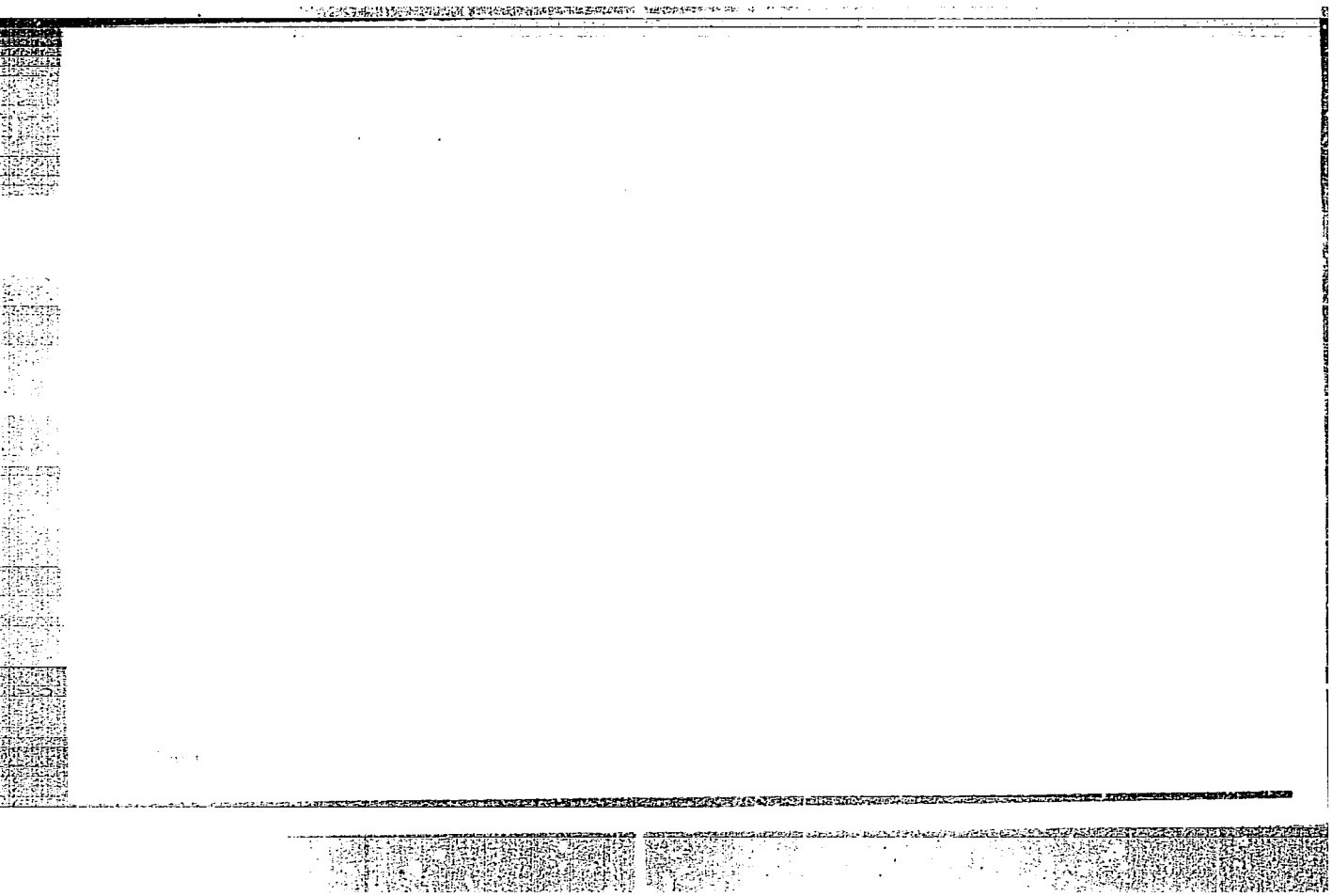

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KESSLER, A.

Graphs for determining the time-depdendent temperature field in finite rods or plates with internal heat sources. Inzh.-fiz. zhur. 7 no. 3:134-136 Mr '64. (MIRA 17:5)

1. Fizicheskiy institut Slovatskoy Akademii nauk, Bratislava, Chekhoslovatskaya Sotsialisticheskaya Respublika.

KESSLER, Arnost, RNDr. CSc.

Analysis of measured heating and cooling curves of electric machines. Acta techn Cz 9 no.4:347-377 '64

1. Institute of Physics, Slovak Academy of Sciences, Bratislava.